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Robert E. Stewart

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Carmen Patti Law Group, LLC
One N. LaSalle Street
44th Floor
Chicago, IL 60602

EXAMINER

HOEKSTRA, JEFFREY GERBEN

ART UNIT

PAPER NUMBER

3736

MAIL DATE

DELIVERY MODE

10/20/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/681,529	Applicant(s) STEWART, ROBERT E.	
	Examiner Jeffrey G. Hoekstra	Art Unit 3736	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 August 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23, 25-27 and 29-52 is/are pending in the application.
- 4a) Of the above claim(s) 17-22 and 48-52 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16, 23, 25-27 and 29-47 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) ☐ Notice of References Cited (PTO-892) | 4) ☐ Interview Summary (PTO-413) |
| 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) ☐ Information Disclosure Statement(s) (PTO/SB/08) | 5) ☐ Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) ☐ Other: _____ |

DETAILED ACTION

Notice of Amendment

1. In response to the amendment filed on 08/04/2010, amended claim(s) 1, 11, 25, 27, 29, 30, 32, and 44 and cancelled claim(s) 28 is/are acknowledged. The current rejection of claim(s) is/are *withdrawn*. The following new and/or reiterated ground(s) of rejection is/are set forth:

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 25-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Onari et al. (US 6,132,391, hereinafter Onari) as broadly as *structurally* claimed.

4. For claim 25 Onari discloses and shows an apparatus (41) (as best seen in Figures 5-10), comprising *inter alia*:

- multiple sensors (at least 12, 13, and/or 43) that produce multiple signals based on motions of an individual (column 2 line 49 – column 4 line 7, column lines 8-25, column 8 line 50 - column 9 line 54, column 14 line 35 – column 15 line 15, and column 21 line 41 – column 22 line 12);
- at least one processing component (14, 16, 21, 22, 44 and 45) that employs respective multiple signals to make a determination of respective positional changes

of a plurality of locations on the individual (column 15 line 16 – column 17 line 15)

(the Examiner notes the processing components make distinct determinations on at least each of the positional changes of each of the multiple sensors); and

- a map of an environment, which the individual is in, derivable from the anthropometric dead reckoning of the individual (as best seen in Figures 5A-5B) (column 11 line 41 – column 14 line 29),
- wherein the multiple sensors are disposed in contact with the plurality of locations on the individual (as best seen in Figures 5A-5B) (column 13 lines 12-40),
- wherein the multiple sensors produce signals for the at least one processing component to measure the three dimensional motion respectively of the plurality of locations on the individual and the joints of the individual (column 2 line 49 – column 4 line 7, column lines 8-25, column 8 line 50 - column 9 line 54, column 13 lines 12-40, column 14 line 35 – column 15 line 15, column 15 line 16 – column 17 line 15, and column 21 line 41 – column 22 line 12), and
- wherein the motions are measured and reconstructed from a known starting location and recorded position information to determine anthropometric dead reckoning of the individual (column 13 lines 12-40 and column 15 line 16 – column 17 line 15).

5. For claim 26, Onari discloses and shows the apparatus, wherein the map of the environment, which the individual is in, is an updated map of an outdated map of an area (column 15 line 1 – column 17 line 15, and column 21 line 41 – column 22 line 12) (as best seen in Figures 5A-5B).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 7-16, 27, 29-32, and 38-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onari et al. (US 6,132,391, hereinafter Onari) in view of Levi et al. (US 5,583,776, hereinafter Levi).

8. For claims 1, 11, 13, 27, 29, 30, and 32, Onari discloses and shows an apparatus (41) (as best seen in Figures 5-10), comprising *inter alia*:

- multiple sensors (at least 12, 13, and/or 43) that produce multiple signals based on motions of a plurality of locations of an individual and motions of multiple respective joints of an individual (column 2 line 49 – column 4 line 7, column lines 8-25, column 8 line 50 - column 9 line 54, column 14 line 35 – column 15 line 15, and column 21 line 41 – column 22 line 12), wherein the multiple joint motions refer to a body movement of the individual (the Examiner notes the plurality of locations may be at least 2 or 3 distinct locations on the hand of a user carrying the portable position detector containing sensor elements 12, 13, and 43 and that while carrying the detector the motion of the plurality of locations includes motions of respective joints, i.e. the motion of the hand carrying it and/or the representative motion of the leg motion of the individual while traversing) (the Examiner also notes Onari explicitly

states, column 21 lines 58-59, "The components of the present invention may be separately dispersed and disposed" and, column 9 lines 14-17, "Moreover, the pedometer 12 may use commercially available pedometer separately provided. In this case, the output signal of the separately provided pedometer is input to the control section 11 via a cable and connector.");

- at least one or more processing components (14, 16, 21, 22, 44 and 45) that employs respective multiple signals to make a determination of respective positional changes of plurality of locations on the individual and respective positional changes of the respective joints of the individual (column 15 line 16 – column 17 line 15) (the Examiner notes the processing components make distinct determinations on the positional changes of each of the multiple sensors);
- a map of an environment, which the individual is in, derivable from the anthropometric dead reckoning of the individual (as best seen in Figures 5A-5B) (column 11 line 41 – column 14 line 29); and
- data indicative of the measured and reconstructed motions (as best seen in Figures 5A-5B) (column 13 lines 12-40), the data being fed back to the individual via a display (17) (column 13 lines 12-40 and column 15 line 16 – column 17 line 15),
- wherein the multiple sensors are disposed in contact with the plurality of locations on the individual and in contact with the respective joints of the individual (column 2 line 49 – column 4 line 7, column lines 8-25, column 8 line 50 - column 9 line 54, column 14 line 35 – column 15 line 15, and column 21 line 41 – column 22 line 12),

- wherein the multiple sensors produce signals for the one or more processing components to measure the three dimensional motion respectively of the plurality of locations on the individual and the joints of the individual (column 2 line 49 – column 4 line 7, column lines 8-25, column 8 line 50 - column 9 line 54, column 13 lines 12-40, column 14 line 35 – column 15 line 15, column 15 line 16 – column 17 line 15, and column 21 line 41 – column 22 line 12),
- wherein the motions, including the multiple joint motions, are measured and reconstructed from a known starting location and recorded position information to determine anthropometric dead reckoning of the individual to thereby construct a path traversed by the individual (column 13 lines 12-40 and column 15 line 16 – column 17 line 15), and
- wherein the multiple sensors comprise a plurality of different sensors that measure a plurality of different parameters of the individual (column 2 line 49 – column 4 line 7, column lines 8-25, column 8 line 50 - column 9 line 54, column 14 line 35 – column 15 line 15, and column 21 line 41 – column 22 line 12).

9. For claims 1, 11, 13, 27, 29, 30, 32, and 44, Onari discloses and shows the claimed invention, as set forth and cited above, except for expressly disclosing the following:

- the multiple sensors are integrated into a suit wearable by the individual (for claim 1),
- the multiple sensors are located in the suit at positions that are adjacent to multiple joints of the individual (for claim 11) ,

- a barometric altitude sensor that provides altitude information to one or more of the one or more processing components, wherein the altitude information of the barometric altitude sensor supplements the positional change determined by the one or more processing components, and wherein the barometric altitude sensor measures an atmospheric pressure to make a determination of an altitude change of the positional change of the individual (for claims 13, 29, 30, 32, and 44), and
- the data is fed back to at least one of the sensors on the individual (for claim 27).

10. For claims 1, 11, 13, 27, 29, 30, 32, and 44, Levi teaches a dead reckoning navigational system for measuring and reconstructing the motions of an individual (Abstract), comprising *inter alia*:

- multiple sensors are integrated into a suit wearable by an individual (column 1 line 59 – column 2 line 14, column 3 line 12 – column 4 line 26, and column 6 line 60 – column 8 line 40),
- the multiple sensors are located in the suit at positions that are adjacent to multiple joints of the individual (column 1 line 59 – column 2 line 14, column 3 line 12 – column 4 line 26, and column 6 line 60 – column 8 line 40),
- a barometric altitude sensor (column 1 line 59 – column 2 line 14, column 3 line 12 – column 4 line 26, and column 6 line 60 – column 8 line 40) that provides altitude information to one or more of the one or more processing components (column 1 line 59 – column 2 line 14, column 3 line 12 – column 4 line 26, and column 6 line 60 – column 8 line 40), wherein the altitude information of the barometric altitude sensor supplements the positional change determined by the one or more processing

components (column 1 line 59 – column 2 line 14, column 3 line 12 – column 4 line 26, and column 6 line 60 – column 8 line 40), and wherein the barometric altitude sensor measures an atmospheric pressure to make a determination of an altitude change of the positional change of the individual (column 1 line 59 – column 2 line 14, column 3 line 12 – column 4 line 26, and column 6 line 60 – column 8 line 40), and

- the data is fed back to at least one of the sensors on the individual (column 1 line 59 – column 2 line 14, column 3 line 12 – column 4 line 26, and column 6 line 60 – column 8 line 40).

11. Thus for claims 1, 11, 13, 27, 29, 30, 32, and 44, all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention. All of the component parts are known in Onari and Levi. The only difference is the combination of the component parts into a single device. Thus, it would have been obvious to one having ordinary skill in the art at the time of the invention to combine the components as taught by Onari with the components as taught by Levi to achieve the predictable results of increasing the efficacy of a device to measure and reconstruct the motions of an individual using additional sensor configurations.

12. For claims 7 and 38, Onari discloses and shows the apparatus, further comprising *inter alia*: a filter component that weighs and combines the positional change determined by the one or more processing components based on the multiple joint motions of the individual (column 15 line 1 – column 17 line 15) and position information from one or more supplementary navigation components (43) (column 15 line 1 – column 17 line 15).

13. For claims 8 and 39, Onari discloses and shows the apparatus, wherein the supplementary navigation components comprise a global positioning system (43), and wherein the filter component weighs and combines position information from the one or more processing components and the supplementary navigation components based on a relative reliability of the one or more processing components and the supplementary navigation components (column 14 lines 35 – column 17 line 15).

14. For claims 9 and 40, Onari discloses and shows the apparatus, wherein one or more of the one or more processing components receive position correction information of the individual from one or more supplementary navigation components (column 15 line 1 – column 17 line 15).

15. For claims 10 and 41, Onari discloses and shows the apparatus, wherein one or more of the one or more processing components provide initial position information of the individual to one or more supplementary navigation components upon initialization of the one or more supplementary navigation components (column 15 line 1 – column 17 line 15).

16. For claims 12 and 43, Onari discloses and shows the apparatus, further comprising *inter alia*: a magnetic heading sensor (13) that provides direction information to one or more of the one or more processing components (column 2 line 49 – column 4 line 7, column lines 8-25, column 8 line 50 - column 9 line 54, column 14 line 35 – column 15 line 15, and column 21 line 41 – column 22 line 12), wherein the direction information of the magnetic heading sensor supplements the positional change determined by the one or more processing components (column 15 line 1 – column 17 line 15), and wherein the magnetic heading sensor employs the Earth's magnetic field to make a determination of a direction of the positional change of the individual (column 9 lines 30-54).

17. For claims 14 and 45, Onari discloses and shows the apparatus, wherein the multiple sensors and the one or more processing components are calibrated to the individual by having the individual traverse a known path to monitor how multiple joint motions of the individual respond to the known path (column 13 lines 12-40 and column 15 line 16 – column 17 line 15) (as best seen in Figures 5A-5B).

18. For claims 15 and 46, Onari discloses and shows the apparatus, wherein the one or more processing components calculate an updated position of the individual based on the known starting location and the positional change of the individual (column 13 lines 12-40 and column 15 line 1 – column 17 line 15), and wherein the one or more processing components send the updated position of the individual to one or more of a display component (17) and a recording component (22) (column 13 lines 12-40 and column 15 line 1 – column 17 line 15).

19. For claims 16 and 47, Onari discloses and shows the apparatus, wherein the multiple sensors comprise multiple rate sensors (column 2 line 49 – column 4 line 7, column lines 8-25, column 8 line 50 - column 9 line 54, column 14 line 35 – column 15 line 15, and column 21 line 41 – column 22 line 12).

20. For claim 30, Onari discloses and shows the apparatus, wherein the multiple sensors comprise a gyroscope that measures angular rate, an accelerometer that measures linear motion, and a magnetic heading sensor that provides information on the direction of the movement of the individual (column 2 line 49 – column 4 line 7, column lines 8-25, column 8 line 50 - column 9 line 54, column 14 line 35 – column 15 line 15, and column 21 line 41 – column 22 line 12).

21. For claim 31, Onari discloses and shows the apparatus, wherein the multiple sensors comprise at least a first sensor that measures direction of movement of the individual and a second sensor that measures displacement of movement of the individual (column 2 line 49 – column 4 line 7, column lines 8-25, column 8 line 50 - column 9 line 54, column 14 line 35 – column 15 line 15, and column 21 line 41 – column 22 line 12).

22. Claims 2-6, 23, and 33-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onari et al. (US 6,132,391, hereinafter Onari) in view of Levi et al. (US 5,583,776, hereinafter Levi) and in further view of Kramer (US 5,592,401).

23. Onari in view of Levi discloses and the claimed invention, as set forth and cited above, except for expressly disclosing the multiple sensors comprising strain sensors

(see claims 2 and 33), the claimed limitations of said strain sensors (see claims 3-6 and 34-37), and the multiple sensors being arranged bi-laterally disposed (see claim 23).

24. Kramer teaches and shows an apparatus, comprising *inter alia*:

- multiple sensors that are adapted to be in contact with multiple joints of an individual and produce multiple signals based on multiple joint motions of an individual (column 6 line 17 – column 7 line 35, column 9 lines 42-51, column 10 lines 25-28, column 12 lines 8-17, and column 15 lines 16-19); and
- multiple processing components that employ one or more of the multiple signals to make a determination of a positional change of the individual (column 11 lines 12-25); wherein the multiple sensors produce multiple signals representative of the three dimensional motion of multiple joint motions,
- wherein the multiple joint motions are measured and reconstructed from a known starting location and the recorded position information to determine a path traversed by the individual (as best seen in Figure 1, column 4 line 26 – column 6 line 6, and column 17 lines 6-11),
- wherein a first strain sensor of the multiple strain sensors detects a bending of a first joint of the individual, wherein the first strain sensor represents the bending as first strain information in a first signal of the multiple signals (column 6 line 17 – column 7 line 22, column 12 lines 8-17, and column 12 lines 16-19),
- wherein one or more of the multiple processing components employ the first strain information to make a determination of a displacement of the positional change of the individual (column 11 lines 12-25 and column 17 lines 6-11),

- wherein a second strain sensor of the multiple strain sensors detects a twisting of a second joint of the individual,
- wherein the second strain sensor represents the twisting as second strain information in a second signal of the multiple signals (column 6 line 17 – column 7 line 22, column 12 lines 8-17, and column 12 lines 16-19),
- wherein one or more of the multiple processing components employ the second strain information to make a determination of a direction of the positional change of the individual (column 11 lines 12-25 and column 17 lines 6-11),
- wherein one or more of the multiple processing components employ the displacement of the positional change, the direction of the positional change, and a known starting location of the individual to make a determination of an updated position of the individual (column 11 lines 12-25 and column 17 lines 6-11), and
- wherein the multiple sensors are arranged bi-laterally on the individual (as best seen in Figure 2) (column 20 lines 43-56).

25. The claimed invention would have been obvious because the substitution of one known element for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention. Because both Onari in view of Levi and Kramer teach multiple sensors operably disposed with a processor for measuring the positional change of an individual, it would have been obvious to one skilled in the art at the time of the invention to substitute one motion detecting sensor for the other to achieve the predictable results of measuring the positional change of an individual with an alternate motion detecting sensor.

Response to Arguments

26. Applicant's arguments with respect to claims 1-16, 23, and 27-47 have been considered but are moot in view of the new ground(s) of rejection.

27. Applicant's arguments filed 08/04/2010 have been fully considered but they are not persuasive. Applicant argues the anticipatory rejection of claims 25 and 26 under Onari, specifically arguing Onari fails to disclose, teach, and/or fairly suggest the following:

- a) "a map of an environment, which the individual is in, derivable from the anthropometric dead reckoning of the individual" and
- b) "wherein the map of the environment, which the individual is in, is one of a map of an area previously unmapped, is a corrected map of an incorrectly mapped area, and an updated map of an outdated map of an area".

28. The Examiner disagrees, maintains the rejection as set forth and reiterated above, and in response notes the following:

29. In response to Applicant's arguments (a) and (b), the Examiner notes Onari is expressly concerned with mapping walking patterns of an individual based on the personal metrics of the individual, the step length of the individual, and the measured position(s) of the individual (column 11 line 41 – column 14 line 29). The displayed moving route is updated when the individual changes position. The map of the environment may be fairly and reasonably considered to be merely the displayed moving route of the individual, absent any limitations to the contrary the moving route is

the structural equivalent thereof. Figures 5A and 5B clearly show the mapping of the moving route of the individual not only derivable from the anthropometric dead reckoning of the individual but actually derived from the anthropometric dead reckoning of the individual. Figures 5A and 5B also clearly show the map being updated when the individual's position is outdated because they have taken at least a step or their position has changed.

Conclusion

30. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey G. Hoekstra whose telephone number is

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(571)272-7232. The examiner can normally be reached on Monday through Friday 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Max Hindenburg can be reached on (571)272-4726. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jeffrey G Hoekstra/
Examiner, Art Unit 3736